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Research Product 85-13

User's Manual for Predicting Military Task Retention

Training and Simulation Technical Area
Training Research Laboratory

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Research Product 85-13

User's Manual for Predicting Military Task Retention



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Education and Training

FOREWORD

The decline in task performance caused by forgetting is a critical training problem in the Army. One of the trainer's primary responsibilities is to ensure that his or her soldiers remain proficient on tasks they have already learned. This means doing periodic refresher training because soldiers forget tasks not practiced in the unit on a regular basis. Unfortunately, unit training resources are scarce, and no method is available for helping the trainer identify tasks that either have been or are about to be forgotten. Without such information it is difficult to target refresher training effectively, and thereby, obtain maximum payoff from the limited training resources available.

In response to this need, the U.S. Army Research Institute for the Behavioral and Social Sciences (ARI) has developed an easy-to-use method for predicting how rapidly individual tasks will be forgotten over intervals of no practice extending up to one year. The method has been developed in both paper-and-pencil and computer-based format and is geared to help trainers decide what tasks are most likely to be forgotten, how many soldiers will be able to perform a task correctly at any point in time, and when and how often refresher training should be conducted.

This report provides the step-by-step guidance on how to use both the paper-and-pencil and computer-based versions of the method in order to make reliable and valid task retention predictions.



Edgar M. Johnson
Technical Director

USER'S MANUAL FOR PREDICTING MILITARY TASK RETENTION

EXECUTIVE SUMMARY

Requirement:

To develop an easy-to-use method for predicting how rapidly individual tasks will be forgotten over intervals of no practice extending up to one year; to develop this method in both paper-and-pencil and computer-based formats; to generate estimated proficiency scores for all Common Soldier tasks and all tasks in MOS 11B, 13B, and 19E.

Procedure:

A method for predicting task retention performance was developed. This method was derived from and validated against field test data collected from Army troops. Both a paper-and-pencil manual version and a computer-based automated version (designated for the Apple II+ or IIe microcomputer) were designed. Task proficiency estimates were generated by project staff who were familiar with the tasks and the rating procedures.

Findings:

This User's Manual presents the step-by-step procedures on how to use both the paper-and-pencil and computer-based versions of the method. By following these procedures, users can make reliable and valid task retention predictions.

Utilization of Findings

This method to generate retention predictions can be used to provide information to Army personnel to assist training management decisions, such as the identification of tasks that are likely to be forgotten, and when to schedule refresher training.

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USER'S MANUAL FOR PREDICTING MILITARY TASK RETENTION

I. Introduction

One of the primary responsibilities of training managers is to make sure soldiers stay trained on tasks they've already learned. This means doing periodic refresher training, because soldiers will forget tasks not practiced in the unit on a regular basis. Unfortunately, unit resources for refresher training are scarce. The problem in the field is to make best use of these limited resources to get the biggest payoff.

The payoff obtained depends in part on the tasks selected for refresher training. Ideally, time should be spent only on tasks that have been or are about to be forgotten. Until recently, this has not been easy to do. Trainers have had to rely on "best guess" estimates in determining what and when to train. Until now there was no method to help the trainer estimate how quickly different tasks are likely to be forgotten.

The Army Research Institute (ARI) has been investigating the problem of forgetting over the past few years and now has come up with some answers to help the trainer. Under contract to ARI, the American Institutes for Research has developed an easy-to-use method for predicting how rapidly individual tasks are forgotten when they are not practiced. This method is geared to help those at the Squad, Platoon, Company, or Battalion level who have to decide what to retrain and when to give refresher training.

The method requires that each task of interest be rated on how difficult it is to remember. This rating depends on the extent to which a task contains certain characteristics known to influence memory, such as whether or not it is job aided, and how many performance steps it requires. Each task is rated by answering questions about a maximum of ten characteristics. Each answer is then given a numerical score which, when totaled across questions, is used to predict retention. The lower the total score (i.e., the more difficult a task is judged to be), the quicker the task is predicted to be forgotten.

The method has been developed in both a paper-and-pencil manual version and a computer-automated version, with the latter designed for the Apple II+ or IIe microcomputer. Both paper-and-pencil and computer versions are designed to be used by subject matter experts who have knowledge of the tasks to be rated and of the task characteristics used to derive the ratings.

If used properly, either version of the rating procedure can help with planning individual task sustainment or refresher training. While it cannot predict the performance of any individual soldier, or the mission criticality of any specific task, it can answer some important questions for effective training management: How quickly are specific tasks forgotten? Which tasks are most likely to be forgotten or retained? How many soldiers can perform a task correctly at any point in time? When and how often should refresher training be conducted? Since it is not possible to continually refresh every soldier on every task, choices must be made. The ratings produced by this method will help training managers in the field make these choices with minimum effort and with better than "best guess" accuracy.

The next section of this manual describes how to use the paper-and-pencil version of the method to derive the task ratings. The last section does the same for the computer-based version of the method.

II. Instructions for Paper-and-Pencil Version

The paper-and-pencil version contains ten questions. Each question has from two to four choices of answers. There is a "Definitions" section designed to clarify the meaning of each question. It is important that you read all of the "Definitions" information before selecting your answers.

The paper-and-pencil version also contains a Task Difficulty Rating Form ANSWER SHEET (following p. 29), on which you will record your answers for each question on each task.

Here is the step-by-step procedure to follow:

1. List the names of all of the tasks you are going to rate in the first column of the ANSWER SHEET. You may shorten the title or use abbreviations. Also enter the Military Occupational Specialty (MOS) designation at the top. If you are doing more than one MOS, use separate ANSWER SHEETS for each MOS.
2. The purpose of this material is to give all raters the same basis on which to make their ratings and to avoid the possibility of missing any of the steps required to perform each task. Refer to the Soldier Training Publication (STP), formerly called the Soldier's Manual (SM), to obtain a description of each task you have listed. You may also use task descriptions found in Technical Manuals or copies of the Skill

Qualification Test (SQT), if these descriptions are consistent with those found in the STP.

3. Read the first question (Questions begin on page 7), the choices and the Definitions. Review the description of each task as needed. Select the best answer for Task 1. Note the Scale Value for the choice you selected. Write that Scale Value in the box in the ANSWER SHEET corresponding to that task and question.
4. Continue in this manner until you have answered all of the questions for Task 1 and have entered the Scale Values on the ANSWER SHEET. Depending on your answer, you may be asked to skip certain questions. Follow the instructions in that case.
5. Add the individual Scale Values for Task 1 and enter the total in the "Total Score" column of the ANSWER SHEET.
6. Follow the same procedure for any additional tasks you wish to rate.

If you wish to convert the ratings to performance estimates, use the instructions on page 28.

Remember to rate the tasks as they would be tested, not as they would be performed in an operational situation. The reason for this is that proficiency will be measured by a test; the predictions are related to test performance.

Question 1. Are job or memory aids intended to be used in performing this task?

Answer Choice	Scale Value
● Yes	1
● No	0

Definitions

Job and memory aids are designed to assist the soldier in doing a task correctly. Examples include:

- Memory joggers learned in school, such as S - A - L - U - T - E.
- The Soldier's Manual as used on the job to help do the task properly.
- Labels or instructions that are printed on equipment or containers.
- Manuals published by manufacturers to be used while performing check-out or maintenance tasks on equipment.

The key to accurately answering this question lies in the way the task is intended to be performed. For example, it is intended that the STP or Technical Manual be used while performing most maintenance tasks. That is the way these tasks are taught and the way they are tested. So, if a job or memory aid is used while performing a task, you

should answer this question "YES," and answer the remaining questions in this form as if such a manual will be available and used. If a job or memory aid is not used while performing a task, and none is used in testing that task, then the answer to this question would be "NO."

Write the Scale Value ("1" or "0") for the answer you select in the first column, labeled "Job/Memory Aid," of the ANSWER SHEET. If you selected a "No" answer ("0") to this question, skip the next question and go to Question 3 on page 12.

NOTE: IF THERE IS NO JOB OR MEMORY AID,
DO NOT ANSWER THIS QUESTION. GO TO
QUESTION 3 ON PAGE 12 --->

Question 2. How would you rate the quality of the job or
memory aid?

Answer Choice	Scale Value
● Excellent. Using the job/memory aid, a soldier can do the task correctly with <u>no</u> additional information or help.	56
● Very Good. With the job/memory aid, a soldier would need only a little additional information to complete the task.	25
● Marginally Good. Even with the job/memory aid, a soldier would need some additional information to complete the task.	2
● Poor. Even with the job/memory aid, a soldier would need a great deal of additional information in order to complete the task.	1

Definitions

This question requires you to think about the ability of the job or memory aid to actually lead the soldier through the task without error. Some aids may be technically accurate but very difficult to understand and

to follow. Their reading level may be far too difficult for the average soldier to comprehend. They should be rated "Poor." Some may be helpful, but are incomplete - there is important information missing. For example, they may tell the soldier what to do, but not how to do it. They should be considered "Marginally Good."

"Very Good" aids are generally easy to understand and are mostly complete. A soldier would need to know or remember relatively little additional information to complete the task successfully. "Very Good" aids would tell how to do the task, not just what to do. The difference between "Marginally Good" and "Very Good" is in the amount of information given or the ease of finding that information.

"Excellent" aids cover all the steps in a careful and easy to understand way and the reading level is matched to the level of those using it. For example, they tell you what, where, how, what tools to use and what safety steps to look out for. Pictures and diagrams are often used in "Excellent" or "Very Good" aids.

The following examples for the task "Turn On Electrical Test Panel" may help in making your choice:

"Excellent" job aid - Easy to read instructions printed clearly on the electrical test panel telling you what to do, how to do it, and in what order to do it. Pictures are used.

"Very Good" job aid - A booklet that tells you basically the same information but it does not show where the knobs and switches are located. Errors are possible.

"Marginally Good" job aid - Printed technical instructions that contain other information about the test system mixed in with the needed information. No pictures or diagrams.

"Poor" job aid - Technical reference manuals in which general principles of operation are given using complex language - you must try to determine the actual procedure for yourself.

Choose your answer. Now enter the Scale Value for that answer on the ANSWER SHEET under the column labeled 2, "Job/Memory Aid Quality." If you select "Excellent" as the answer to this question, skip to Question 6 on page 18.

NOTE: IF YOU RATED THE JOB AID AS "EXCELLENT,"

DO NOT ANSWER THIS QUESTION.

GO TO QUESTION 6 ON PAGE 18 --->

Question 3. How many steps are required to do the task?

Answer Choice	Scale Value
● One step	25
● Two to five steps	14
● Six to ten steps	12
● More than ten steps	0

Definitions

For purposes of this rating you should use the number of performance steps listed in the technical materials you have (for example, the STP).

If the reference manual does not provide sufficient information, or if you feel that a task has not been broken down accurately into performance steps, the following guidance may be helpful:

- A step is a separate physical or mental activity within a task, which has a well defined, observable beginning and ending point. It must be performed to complete a task correctly. Thus, identifying a task is considered one step, even though a number of decisions are needed to arrive at the correct

answer (for example, note location of turret, count number of road wheels, etc.). These decisions, however, are not observable.

- A task may consist of only one, a few, or many steps.
- Tasks involving assembling or disassembling a piece of equipment tend to be multi-step tasks. Assembling the M16 rifle would be an example of a multi-step task.

Determine your answer. Enter the Scale Value for this answer on the ANSWER SHEET in the third column labeled "Number of Steps."

If you select the first answer ("One step"), skip to Question 6 on page 18.

NOTE: IF THE TASK HAS ONLY ONE STEP,
GO TO QUESTION 6 ON PAGE 18 --->

Question 4. Are the steps in the task required to be performed in a definite sequence?

Answer Choice	Scale Value
• None are	10
• All are	5
• Some are and some are not	0

Definitions

Some tasks are composed of steps that can be performed in any sequence. For example, "Employ Phonetic Alphabet" is a task that is not scored for sequence. Such tasks should be given a Scale Value of "10."

Other tasks, such as "Splint a Fracture," are made up of steps that have only one correct sequence. Failure to follow the particular sequence results in a "NO GO" on that task. These tasks should be given a Scale Value of "5".

A task that is a mixture of sequenced and non-sequenced steps should be given a Scale Value of "0".

Use the information that is contained in the STP to help you answer this question.

Choose your answer. Enter the Scale Value for your answer in the fourth column (labeled "Sequence") of the ANSWER SHEET.

NOTE: IF THE TASK HAS ONLY 1 STEP,
SKIP THIS QUESTION AND GO TO
QUESTION 6 ON PAGE 18

Question 5. Does the task have a built-in logic so that
you can tell if you are doing it correctly?

Answer Choice	Scale Value
● Has built-in logic for all steps	22
● Has built-in logic for most steps	19
● Has built-in logic for only a few steps	11
● Has no built-in logic	0

Definitions

Examples of tasks that have built-in logic are:

- Disassembling a piece of equipment in which removing one section automatically uncovers the next section (e.g., opening up a container to remove contents).
- Equipment operation in which the steps form a logical progression (e.g., "power-up" comes first).
- Assembling a sub-part that does not fit the larger assembly, thus indicating that some earlier step was incorrect.
- The completion of the task provides an automatic check on the correctness of it. For example, changing a tire would have some of these

characteristics (e.g., parts left over, wheel does not turn).

Tasks that have the least built-in logic tend to have many branching steps that could be taken ("If this, then that" types of steps), or have safety checks that break the flow of a task's steps (e.g., checking the backblast area when correcting a malfunction on an M72A2 LAW).

Choose your answer and enter the Scale Value for your answer in the column headed "Logical."

Question 6. Does the task have a time limit for its completion?

Answer Choice	Scale Value
● There is no time limit.	40
● There is a time limit, but it is fairly easy to meet under test conditions.	35
● There is a time limit and it is difficult to meet under test conditions.	0

Definitions

The time allowed to complete a task is a dimension of task difficulty.

The first choice above means that no time limit has been established for the task (in the STP) so that a "GO" may be achieved even though one soldier may take much longer to do the task than another soldier. This choice is also appropriate when a time limit is so liberal that no one ever fails to meet it.

The second choice above applies to those tasks, such as assembling the M60 machinegun, that have a time limit that some soldiers may find difficult to meet. In this case, the STP has set a time limit that "pressures" the average soldier a bit, but only a few would get a "NO GO" because of it.

The third choice above is for tasks that have a time limit that is difficult to meet. Safety and combat-related tasks, such as "Sight a target through the gunner's telescope within 10 seconds" would fall into this category. Soldiers being tested on this kind of task often get a "NO GO" on the basis of time alone.

Select your answer and then enter the Scale Value for that answer under the column labeled "Time."

Question 7. What are the mental or thinking requirements of this task?

Answer Choice	Scale Value
● Almost no mental requirements	37
● Simple mental requirements	28
● Complex mental requirements	3
● Very complex mental requirements	0

Definitions

This question gets at the difficulty of the thought processes that a soldier must go through during task performance.

A task requires almost no mental processing if it is essentially physical, or highly repetitive (e.g., marching in line, saluting).

A task requires simple mental processing if it involves making gross comparisons; estimating relative size, weight, or distance; performing simple computations; or memorizing one or two names, terms or facts.

Complex mental processes require the soldier to make a choice or decision based on subtle but discrete clues (e.g., prioritizing fixed targets, identifying different types of aircraft or vehicles).

A task requires very complex mental processes if it requires rapid decisions based on detailed, technical information (e.g., planning an attack, troubleshooting complex equipment).

In answering this question, consider the impact of a job or memory aid (if an aid is supposed to be used) on the thinking requirements of this task. However, note that job aids are generally less helpful in the area of higher thought processes than they are in the areas of rote memory or proceduralized tasks.

Choose your answer and then enter the Scale Value on the ANSWER SHEET in the column labeled "Mental Requirements."

Question 8. How many facts, terms, names, rules or ideas must a soldier memorize in order to do the task?

Answer Choice	Scale Value
● None (or the job/memory aid provides all necessary information)	20
● A few (1 - 3)	18
● Some (4 - 8)	13
● Very many (more than 8)	0

Definitions

This question gets at the amount of material a soldier must remember in order to do the task.

Examples of the types of information that may have to be remembered are:

- Military nomenclature (terms)
- Conversion formulas
- Codes or call numbers
- Technical names, specifications or tolerances
- Doctrinal principles or rules of thumb

Remember to consider the impact of the job or memory aid (if an aid is supposed to be used) in answering this question. If there are facts, terms, etc., that are needed

in order to do the task, but some or all are covered in the job aid, your answer should reflect this. (Thus a potential "Very many" rating may be reduced to "A few" rating by a "Very Good" job aid.)

Select your answer and then enter the Scale Value for that answer in the column labeled "Number of Facts."

Question 9. How hard are the facts, terms, etc., to remember?

Answer Choice	Scale Value
● Not applicable - there are none to remember or the job or memory aid provides all of the needed information.	34
● Not hard at all - the information is simple.	31
● Somewhat hard - some of the information is complex.	12
● Very hard - the facts, rules, terms, etc., are technical or specific to the task and must be remembered in exact detail.	0

Definitions

This question rates the difficulty of the facts, terms, etc., needed to do the task.

The more common and general the information soldiers must remember, the more likely they are to recall it. The more specific, detailed or technical the information the less likely they are to recall it. Also, unorganized facts and terms (e.g., much military nomenclature) are more likely to be forgotten than facts and terms that are part of a system (e.g., the phonetic alphabet).

The amount of help provided by job and memory aids applies to this question.

Choose your answer and then enter the Scale Value for your answer in the column labeled "How Hard to Remember."

Question 10. What are the motor skill demands of the task?

Answer Choice	Scale Value
● None.	2
● Small but noticeable amount of motor skill required.	0
● Considerable amount of motor skill needed.	16
● Very great demand for motor skill.	3

Definitions

This question has to do with the skill level of finger, hand and arm movements, not with large body movements. Thus a task would be given a "None" if it involves only sheer physical strength or simple, reflexive actions (e.g., pushing, lifting, carrying).

A small but noticeable amount of skill is required by tasks such as driving a nail or adjusting a carburetor screw.

A considerable amount of motor skill is needed for tasks such as driving a manual transmission car or tracking a moving target.

A task requiring very great skill demands would be the repair of a very delicate piece of equipment, such as a microcircuit chip.

Some tasks may combine both a strength component and a motor skill component. For example, a fairly heavy piece of equipment may have to be positioned in a precise location. In such cases, a value of "considerable" or even "very great" would be appropriate, depending on the amount of skill required.

Select your answer and then enter the Scale Value for your answer in the column labeled "Motor Skill Requirements."

Calculating a Total Score

This completes the rating procedure. Check back to make sure you answered all the questions that applied to this task. The questions you skipped (if any) would be blank on the ANSWER SHEET. All others should have a 0 or a number written in on the ANSWER SHEET.

As a final step for each task that you have rated, add the scale values assigned to the ten questions. Record this sum in the column labeled "Total Score." This is the

Task Difficulty Rating that will be used to help estimate task retention performance of soldiers in the field.

Using the Performance Prediction Tables

The two attached Performance Prediction Tables (following the ANSWER SHEET) provide the performance estimates for tasks that have already been rated. They show the estimated unit proficiency -- the expected proportion of soldiers in a unit able to perform a task correctly -- after different amounts of time since the task was last performed correctly.

The first Performance Prediction Table gives these estimates at weekly intervals, up to 26 weeks. The second Table gives these estimates at monthly intervals, up to 12 months.

To find a specific task performance estimate, first locate the line (row) corresponding to the score closest to the obtained Total Score. Then read across either Table until you reach the time interval you are concerned about. The Table entry will be the proportion of soldiers that could be expected to perform the task correctly at that time interval.

EXAMPLE: Total Score from ANSWER SHEET = 140. You want to know what percentage of soldiers can still perform the task 16 weeks after they last practiced it. The entry in the table for 16 weeks is 36(%). The entry in the table for four months is also 36(%).

[illegible]

Performance Prediction Table — Months

Total Score from Answer Sheet	Months Since Last Performance											
	1	2	3	4	5	6	7	8	9	10	11	12
180 +	100	100	100	100	100	100	100	100	100	100	100	100
175	97	95	92	90	87	85	83	81	79	77	75	73
170	94	90	85	81	76	72	69	65	62	59	56	53
165	92	85	78	72	66	61	56	52	48	44	40	37
160	89	80	71	64	57	51	45	40	36	32	29	26
155	86	75	64	56	48	42	36	31	27	23	20	17
150	83	70	58	49	40	34	28	24	20	16	14	11
145	80	65	52	42	34	27	22	17	14	11	9	7
140	77	60	46	36	27	21	16	12	10	7	6	4
135	74	55	40	30	22	16	12	9	6	5	3	2
130	70	50	35	25	17	12	8	6	4	3	2	1
125	67	45	30	20	13	9	6	4	2	1	1	0
120	63	40	25	16	10	6	4	2	1	1	0	0
115	59	35	20	12	7	4	2	1	0	0	0	0
110	54	29	16	8	4	2	1	0	0	0	0	0
105	50	25	12	6	3	1	0	0	0	0	0	0
100	44	20	8	4	1	0	0	0	0	0	0	0
95	38	15	2	0	0	0	0	0	0	0	0	0
90	31	10	3	1	0	0	0	0	0	0	0	0
85	22	5	1	0	0	0	0	0	0	0	0	0
80 or less	3	0	0	0	0	0	0	0	0	0	0	0

Performance Prediction Table — Weeks

Total Score from Answer Sheet	Weeks Since Last Performance																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
180 +	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
175	99	98	98	97	96	96	95	95	94	93	93	92	92	91	90	90	89	89	88	87	87	87	86	86	85	85
170	98	97	96	94	93	92	91	90	88	87	86	85	84	83	82	81	79	78	77	76	75	74	73	72	71	71
165	97	96	94	92	90	88	86	85	83	81	79	78	76	75	73	72	70	69	67	66	65	63	62	61	60	59
160	97	94	91	89	86	84	82	80	77	75	73	71	69	67	65	64	62	60	58	57	55	54	52	51	49	48
155	96	93	89	86	83	80	77	75	72	69	67	64	62	60	58	56	54	52	50	48	46	45	43	42	40	39
150	95	91	87	83	80	76	73	70	66	64	61	58	56	53	51	49	46	44	42	40	39	37	35	34	32	31
145	94	89	85	80	76	72	68	65	61	58	55	52	49	47	44	42	40	37	35	34	32	30	28	27	26	24
140	93	88	82	77	72	68	63	60	56	52	49	46	43	40	38	36	33	31	29	27	26	24	23	21	20	19
135	92	86	79	74	68	63	59	55	51	47	43	40	37	35	32	30	28	26	24	22	20	19	17	16	15	14
130	91	84	77	70	64	59	54	50	45	42	38	35	32	29	27	25	22	21	19	17	16	14	13	12	11	10
125	90	81	74	67	60	54	49	45	40	36	33	30	27	24	22	20	18	16	15	13	12	11	10	9	8	7
120	89	79	70	63	56	50	44	40	35	31	28	25	22	20	17	16	14	12	11	10	9	8	7	6	5	4
115	87	76	67	59	51	45	39	35	30	26	23	20	18	15	13	12	10	9	8	7	6	5	4	4	3	3
110	86	74	63	54	47	40	34	29	25	22	19	16	14	12	10	8	7	6	5	4	4	3	3	2	2	1
105	84	70	59	50	42	35	29	25	21	17	14	12	10	8	7	6	5	4	3	3	2	2	1	1	1	1
100	81	66	54	44	36	29	24	20	16	13	10	8	7	5	4	4	3	2	2	1	1	1	0	0	0	0
95	78	62	49	38	30	24	19	15	11	9	7	5	4	3	2	2	1	1	1	0	0	0	0	0	0	0
90	74	56	42	31	23	17	13	10	7	5	4	3	2	1	1	1	0	0	0	0	0	0	0	0	0	0
85	68	47	32	22	15	10	7	5	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
80	42	17	7	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
75	10	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
70 or less	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

III. Instructions for the Computer-Based Version

Introduction

The paper-and-pencil version just described for predicting task retention has also been developed in a computer-based version. It is called the User's Decision Aid (UDA). By answering a series of questions asked by the computer, you can rate a task and predict a unit's level of performance.

You do not need any special knowledge of computers to use the UDA. The following provides all the step-by-step instructions you will need. It is suggested that you skim through all of the instructions for the UDA before you actually begin to use it.

Getting Started Using the UDA

Before you turn the Apple IIe or II+ computer on,

- Put the diskette labeled "UDA" into the disk drive and close the latch. If the computer you're using has two disk drives, then use Drive 1.

- Now turn the computer on.

At the bottom of the monitor, you'll see the words:

Hit the space bar to continue

You'll also see a small, square, blinking light called the cursor. Whenever you see the blinking cursor, it means that the computer is waiting for you to respond. In this case you should

- Press the space bar.

The following message will appear on the monitor,

DO YOU WANT HARD COPY?

TYPE YES OR NO AND HIT THE RETURN KEY

At various points in the program you can print out a permanent paper (hard) copy of the information displayed on the monitor. (Naturally, you must also have a printer attached to the computer, and the printer must be ready to operate.) To print copies, you must answer **YES** to the above question now.

Note: If you aren't sure whether the printer is properly attached and ready to operate, ask someone who knows to check it for you. The UDA won't work if

you ask it to print and the computer isn't set up properly to print.

If you have a printer connected and you want a paper copy during this session,

- Type YES
- Press the RETURN key.

If you do not want a paper copy,

- Type NO
- Press the RETURN key.

The UDA will now show you the Main Menu, which lists all the "jobs" you can do with the UDA. The name of the procedure is shown in the right-hand column and a corresponding letter is shown in the left-hand column. You choose the job you want to do first by typing the letter located next to the job you have chosen. On the Main Menu, you can choose from among these five options or jobs:

A = Create an MOS Task List

B = Rate Tasks and Predict Performance

C = Review Old Ratings

D = Show Existing Rating File Names

Q = Quit/End

When you type in the letter corresponding to your choice, the UDA will present you with information to do the job you selected. After you have completed the job you will be returning to the Main Menu to select another job, or to leave the program (Option Q).

If this is the first time you or anyone else in your group has used the UDA, you will use Option A first to create an MOS Task List. The instructions to do this begin below and extend to page 44. You also use Option A to add new tasks to an existing list.

Once you have a list of tasks in the file, you are ready to rate them, which is done through Option B (Rate Tasks and Predict Performance). The instructions to carry out this option are found on pages 44-52. This option closely parallels the paper-and-pencil version of the process.

Once you (or others) have carried out one or more ratings you may want to review or compare those ratings. This is especially important if more than one person is doing ratings. Option C (Review Old Ratings) allows you to do this. This option is discussed on pages 53-57.

Option D (Show Existing Rating File Names) allows you to see the names of the files that have been saved on a diskette. Such files should be kept on their own diskette, not on the UDA diskette. You create the new diskette when you exercise Option A (Create an MOS Task List). The option to Show Existing Rating File Names is explained on pages 57-58.

Option Q (Quit/End) is used to exit from the UDA program at the end of a session. It is explained on page 58.

Read the descriptions of all five options before you try to use the program for the first time.

Option A: Creating an MOS Task List

Overview: Your first step in using the UDA will usually be to create a file containing the tasks you wish to rate. To do this you will need to supply the task identification numbers and the titles of the tasks. As you enter this information it will be stored on its own diskette so you can retrieve it whenever you wish. The computer will also create a separate index file -- something like a table of contents -- which keeps track of which tasks have been entered. Later, if you want to add to the task list, or find out which tasks have been entered or rated, you will be able to do so by examining this index file.

Step 1: After you type "A" from the Main Menu on the UDA diskette, the disk drive will immediately load the program which you will use to create an MOS task list. The first screen you will see will briefly describe the purpose of the program. It will also advise you that you must provide a second, initialized diskette on which to store the task list and index file.* If you are adding new tasks

* Note: If you are not familiar with how to initialize a diskette consult the guides or manuals that come with your Apple computer, or ask someone who can give you the necessary instructions.

to an existing list, this diskette should already contain the tasks and index files for that list. At this point you should:

- Remove the diskette containing the UDA program from the disk drive and return it to its protective sleeve;
- Insert the second diskette into the same drive -- locking the door down; and
- Press the space bar to continue.

Step 2: The next screen will ask you whether you are creating a new task list or adding tasks to an existing list.

- Press "N" to create a new task list, or
- Press "A" to add tasks to an existing list, or
- Press the <ESC> key to go back to the Main Menu. [Warning: If you want to go back to the main menu you must first reload the diskette containing the UDA program into the disk drive. You will be reminded to do this when you press the <ESC> key.]

Creating a new task list. If you press "N," indicating that you want to create a new task list, you will be asked to indicate which MOS you are rating. The MOS should be entered in the form, e.g. "11B10," or "71L20" or "05C30."

This MOS designation should not be longer than five characters. If you enter more than five characters, you will be asked to re-enter.

If you decide to use some other designation for the MOS you may do so, but it must be five characters in length or less. Any letter or number combination, including a single character, may be used. You must enter something as the MOS designation. The program will ignore a carriage return.

You should not use the same MOS designation more than once on the diskette you are using. If you wish to create a new list for the same MOS you should either give it a different designation or use a separate diskette.

After you have entered an acceptable MOS designation and pressed the <RETURN> key the computer will advise you that a new index file has been created on your diskette. The name of this file will always have the prefix "INDEX/"

followed by the MOS designation you provided. For example, if you entered "64C10," the name of the new index file would be:

"INDEX/64C10"

Note: Although the name of each index file will be accessible through the Main Menu option "D," as a precaution you should also record the name of the files you create on a piece of paper and/or on the label of the diskette itself.

Once the index file has been set up on the disk you can begin to enter task information as requested by the program.

Adding tasks to an existing file. If you press "A," indicating that you want to add tasks to an existing file, you will be asked to supply the name of the index file for the MOS you are rating. The name of the file should be entered exactly as it appeared when the file was created; e.g., "INDEX/64C10."

If you make a mistake while entering the index file name, or if the file does not reside on the diskette you loaded into the drive, the error message:

FILE NOT FOUND - TRY AGAIN

will be printed and you will be asked to re-answer the question where you specified whether you wanted to create a new file (N) or add to an existing file (A). (At this point you could also return to the Main Menu and determine what files are already available on the diskette through Option D. In this way you could get the correct name of the file.)

After you have specified the name of the appropriate index file, you can then commence to add tasks to the list just as you did when the file was first created.

Step 3: From this point on, whether you are creating a new task list or adding new tasks to an existing list, the procedure is exactly the same:

- You must enter the ten digit task identification number for the task; then,
- You must enter the title of the task.

Because the ten digit task identification number is the basis on which all tasks are filed and eventually retrieved, it is very important that you enter each of them accurately. The program requires you to enter the number

in three groups separated by dashes. The identification number looks like this:

123-456-7890 *

You need only enter the numbers. The program automatically inserts the dashes at the appropriate places.

If you make an error, you may use the "<---" key to back up and correct your mistake. However, you must then retype all of the numbers following the mistake. Do not be concerned if you fail to correct a mistake immediately; you will have another chance to verify and change your entry before the task is entered into the file.

After you have entered the last digit you are then asked to enter the task title. This "title" can be any phrase, description or other form of entry you wish. You may even leave the task untitled by hitting <RETURN>.

In using a task title you are restricted only as follows:

* If you do not know what the identification number of the task is you can consult the appropriate Soldier's Manual or other technical materials.

- The entry may not exceed three lines or 120 characters. (A character includes numbers, letters, punctuation marks or blank spaces.)
- You should not press the <RETURN> key until you have finished entering the title; use the space bar to move the cursor from one line to the next. [Remember: the task title will always appear exactly as you enter it now, including words that have been "wrapped around" to next lines.]
- You should not include a colon (":") or comma (",") in the title.

This latter restriction requires some explanation. The computer interprets a colon or comma as indicating the end of the entry. Anything you type after a comma or colon will be ignored. For example, if you enter a task title such as

"Type a military letter, and file copy"

the computer would truncate the title to

"Type a military letter"

and print the warning message:

EXTRA IGNORED.

Step 4: After you have entered the task title, and pressed the <RETURN> key, you will be asked:

ANY CHANGES? Y/N

If you wish to change either the identification number or the title, press "Y" and you can re-enter this information, after which you will again be asked to approve the entries.

If you are satisfied with the entries as shown on the screen, press "N." The task will be automatically stored on the file. The computer will print:

SAVING TASK - PLEASE WAIT.

After the task has been saved (the disk drive will stop) the following type of message will be displayed:

TASK SAVED ON FILE ID123-456-7890.

This is the name of the file for the individual task. Information about this task, including task scores and ratings, will be stored in this file. In addition, the task identification number and title will be added to the index file.

Step 5: After the task is saved, a "menu line" will appear at the bottom of the screen as below:

[C]ontinue: [R]evue list: [P]rinter: [Q]uit.

- If you press "C" in response to this menu you will enter the next task as described in Steps 3 and 4 above.
- If you press "R," you will be shown all of the tasks that have been entered to this point, including those entered during previous sessions. Tasks are shown in groups of three to accomodate the small area of the screen. Hit the space bar to continue through the entire list of tasks.
- If you chose the printer option earlier, and you press "P," all of the tasks in the file will be printed out. If the printer option was declined earlier this command is ignored.
- If you press "Q" you will be asked to verify that you wish to stop adding tasks. If you reply "Yes" you will be reminded to reload the diskette containing the UDA program. Then, on a response to continue, you will return to the Main Menu.

You have now created a working file from which you can rate tasks (Option B) and a master Index file on which are stored all MOS and tasks to be rated. You have also created the file which will save your ratings for later review (Option C). You are now ready to do the actual ratings.

Option B: Rating Tasks and Predicting Performance

Overview: Now that you have created a list of tasks for one or more MOS's, you can rate them with the UDA program. You will select the tasks to be rated one at a time by entering the exact task identification number. You will rate the tasks by answering a series of questions. If you wish, after you have rated the task you can ask the computer to generate a prediction of how well a unit would perform on the task over time. Finally, the program will save your task ratings and scores so that they can be retrieved later on.

Step 1: To rate tasks you must have the diskette containing the UDA program in the drive, with the Main Menu on the screen. To rate tasks, you will type "B." The disk drive will then load the appropriate program into the computer's memory. The first screen you will see after the disk drive stops will ask you to replace the diskette

containing the UDA program with the diskette containing the tasks you wish to rate. You should do so at this point.

- Press the space bar to continue.

Step 2: You must now indicate which specific task you wish to rate by entering the task identification number. You will enter the task number exactly the same way you entered the number when you first created the task list in Option A.

- You need only enter the digits -- the program will insert the dashes at the appropriate places.
- You may correct your entry by using the "<---" key to back up and by retyping the numbers up to the last digit.
- After you have entered the last digit you will be asked to verify your entry -- if you choose you may retype the number from the beginning.

You can only enter one task identification number at a time.

Step 3: If you verify that the task identification number shown on the screen is correct, the program will search the diskette for a file of that name. When it is found the full task identification number and title will be printed on the screen and you will be asked to confirm that it is indeed the task you wish to rate. If you type "No" at this point you will return to Step 2 and repeat the entry.

If the file for the task number you entered cannot be found, the computer will print

FILE NOT FOUND - TRY AGAIN.

You will then return to Step 2.

Step 4: You will now be shown the Task Rating screen, where the task you just selected will be rated. The title of the task appears in the upper portion of the screen. The UDA then asks you the following series of questions about the task:

- Are job or memory aids usually used when performing the task?
- How good are these job or memory aids?

- How many steps are needed to do this task?
- How many of the steps must be performed in a certain order?
- How many of these steps follow a natural, built-in logic?
- Does this task have a time limit?
- What are the mental, or thinking requirements of this task?
- How many facts, terms, names, rules or ideas must be memorized to do the task?
- How hard is it to remember these facts, terms, names, etc.?
- To what extent are physical or motor skills needed to do this task?

Each question is followed by a list of possible answers. Type the letter corresponding to the answer you think best describes the task being rated.

Don't worry if you make a mistake typing the answers. You'll get a chance at the end to go back and correct them.

Step 5: If you aren't sure what a question means or how to answer it, you can see a brief explanation of the question and a sample answer. When you come to a question you need help with,

- Type H

The UDA shows you an explanation and example. After you have read it,

- Press the space bar.

The UDA takes you back to the question you were working on.

Step 6: After you have answered all of the questions, the UDA shows you a summary of your answers and the message:

Any changes? Y/N

- If you don't need to make any changes, type N
- If you do need to make changes, type Y

If you type "Y," the UDA will ask you for the number of the question whose answer you want to change.

- Type the question number whose answer you want to change.
- Press the RETURN key.
- Make the changes you want to make.

Sometimes your changes will affect other questions. The UDA will either automatically make the changes or, if necessary, will ask you to consider certain questions again.

When you have finished making all of your changes, and the message

Any changes? Y/N

appears,

- Type N

Step 7: If you earlier chose to receive paper copy, you'll see the message:

DO YOU WANT HARD COPY? Y/N

If a printer is properly attached to the computer, and the printer is ready to operate, you can print a paper copy of the rating summary for all completed tasks.

- Type Y

If you don't,

- Type N

Step 8: Once you have approved the ratings you will be presented with a new menu:

Select Output Option

W = by week (1-26)

M = by month (1-12)

G = go ahead to rate the next task

Q = quit/return to the Main Menu

By selecting one of the first two options, the UDA can give you a prediction of performance on a task, based on its rating. A point in time is assumed when 100% of the soldiers can perform the task. The UDA predicts what percentage of the unit will be able to perform the task correctly at specific time intervals beyond that point: weekly intervals of 1-26 weeks or monthly intervals of 1-12 months.

If you want the prediction in weeks,

- Type W

If you want the prediction in months,

- Type M.

If you earlier chose to receive hard copy, you can also print out these predictions for the intervals you selected by typing "Y" for "YES" when asked

DO YOU WANT HARD COPY? Y/N

Step 9: The third option, is to press "G" to "go ahead to rate the next task." Selecting this option causes the program to enter the individual question ratings and total retention scores you just made into the task file for later review (under Option C). If other persons have rated the same task before, your scores and ratings will be added to the record -- earlier scores are not lost. Similarly, if you rerate the task your new scores will be saved as a separate record within the task file.

For any given rating session, the first time that you reach this point in the program you will be asked to

- Supply your initials (no more than three letters); and

- Enter today's date in the form MM/DD/YY (e.g., 08/25/84).

This information will be used to label the particular set of scores when they are stored in the task file. Later, if you decide to review the scores assigned to a task you can use this information to identify who made the different ratings and when.

You must supply this information only once per session -- for the first task you rate. Thereafter, your initials and the date will automatically be saved with each set of scores for all subsequent tasks you rate on that date.

After the task scores have been saved you will be taken back to Step 2 to enter the identification number for the next task to be rated.

Step 10: The fourth option from the menu is to press "Q" to quit and return to the Main Menu. The effect of this choice is the same as for Step 9; the ratings and scores are saved in the task file. However, instead of returning to Step 2, to select another task to rate, you will be returned to the Main Menu. You will first be asked to verify that you wish to quit and, if so, will be reminded to reload the diskette containing the UDA program in the disk drive.

Option C: Review Old Ratings

Overview: This option allows you to examine some or all of the information that you or others have stored. Through this program you can determine which tasks have been entered into a master file; which of those tasks have been rated, by whom, and when. You can also retrieve the ratings and scores for each task and compare the scores of different raters.

Step 1: If you type "C" from the Main Menu, with the UDA diskette loaded in the disk drive, the program to review old ratings will be made available. The first screen you will see after the disk drive stops will be a brief description of the program and a reminder to replace the UDA diskette with the diskette containing the tasks you wish to review. You should change diskettes at this point, then press the space bar to continue.

Step 2: The next screen will ask you to provide the index file name for the tasks you wish to review. The index file name is the MOS designation for the tasks (e.g., INDEX/64C10). After you enter the index file name the program will check the diskette loaded into the disk drive to verify that that index file is present. If it is not found, a warning message

FILE NOT FOUND

will be printed and you will be asked to re-enter the name of the index file. If the index file you request is not on the disk, you should check the contents of the disk (see Option D, Showing Existing Rating File Names, pages 57-58).

Step 3: If the named file is found the next screen will present you with a menu as below:

A = LIST TASKS

B = LIST TASKS BY RATER AND DATE

C = REVIEW RATINGS

Q = QUIT/RETURN TO MAIN MENU

Listing tasks. If you press "A" indicating that you want to list tasks, and if you earlier chose to receive hard copy from the printer you will be asked

DO YOU WANT HARD COPY? Y/N

If you answer "YES" the program will list out all of the task identification numbers and titles on the printer. Otherwise the program will list all of the tasks in the file on the screen in groups of three. After the listing has ended you must press the space bar to return to the menu shown above.

Listing tasks by rater and date. Pressing "B" produces the same results as pressing "A," except that some additional information is provided. After the task identification number and title have been printed the initials of each rater who has rated the task and the date the ratings were made, will be listed out on the screen or printer. After the last task has been displayed you must press the space bar to return to the menu.

Reviewing individual task ratings. If you press "C" the screen will clear. At the top of the screen you will be asked to enter the task identification number of the task you wish to review. The entry procedure is exactly the same as that used to enter the task in the master file, or later, to retrieve the task to be rated.

- The number must be entered exactly as it is stored.
- The program automatically inserts the dashes between number groups -- you need only enter the digits.
- You may back up and correct mistakes by using the [<---] key, provided that you retype all of the numbers to the end.

After you have typed the last digit you will be asked to verify that the number is correct:

OK? Y/N

If you press "N" for "no" you may go back and retype the number. Otherwise the program will search the diskette for the task file corresponding to the identification number. If the file is not found, a warning message is printed and you will be asked to re-enter the number. You may immediately return to the menu by pressing the <ESC> key at this point.

If the file is found, the following information about the task will be printed out on the screen:

- The task identification number;
- The task title;
- The initials of each rater who has rated the task and the date the ratings were made;
- The individual ratings of each rater on each question; and
- The total retention score for each rater.

After you have viewed this information on the screen, and provided you earlier chose the hard copy option, you may print out this information by answering "yes" to the query.

You will then be asked whether you wish to review another task or not. If you answer "yes" you will repeat the process described above. If you answer "no" you return to the menu.

Quit/return to the main menu. If you press "Q" you will be asked to first verify that you want to quit. If you verify this choice you will be reminded to reinsert the UDA diskette into the disk drive. A press of the space key will return you to the Main Menu.

Option D: Showing Existing Rating File Names

Overview: This program is designed to provide a handy means of access to the exact names of the index and task files stored on the diskette.

Step 1: When you press "D" from the Main Menu, with the UDA diskette in the disk drive, the program to access file names will be loaded. The first screen you see will ask you to insert the diskette containing the files whose names you wish to review. You should do this and then press the space bar to continue.

Step 2: The program will automatically search the disk and show the exact names of all index and task files on the diskette. After the last name has been listed you should reload the UDA diskette (you will be reminded to do so) and press the space bar to return to the Main Menu.

Option Q: Quit/End

This option ends the UDA program. If you press "Q" from the Main Menu you will first be asked to verify that you wish to quit. If you verify this choice the screen will blank and the program will end.

Turn off the computer and remove the UDA diskette.

It is recommended before you try to use this program to actually rate tasks that you run through it first on a trial basis, using one MOS and one task. You should use each option:

- A - Create the MOS Task List
- B - Rate the Task and Predict Performance
- C - Review Old Ratings
- D - Show Existing Rating File Name
- Q - Quit/End

You will need the UDA diskette and a blank diskette (initialized) on which to store the index file.